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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/543,284	04/05/2000	Boris Dmitrievich Lubachevsky	Lubachevsky-10-2	6481

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EXAMINER	
STEVENS, THOMAS H	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 12/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/543,284	LUBACHEVSKY ET AL.	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/01/2006 & 09/01/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-24 were examined.

Section I: Non-Final Office Action

Claim Interpretation

2. Office personnel are to give claims their **"broadest reasonable interpretation"** in light of the supporting disclosure. *In re Morris,* 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater,* 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551(CCPA 1969). See *also *In re Zletz,* 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow") .... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed .... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.

3. Per MPEP 2131.02 Genus-Species Situations: "A generic claim cannot be allowed to an applicant if the prior art discloses a species falling within the claimed genus." The species in that case will anticipate the genus. *In re Slayter, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); In re Gosteli, 872 F.2d 1008, 10 USPQ2d 1614*

(Fed. Cir. 1989) (Gosteli claimed a genus of 21 specific chemical species of bicycle bicyclic thia-aza compounds in Markush claims. The prior art reference applied against the claims disclosed two of the chemical species. The parties agreed that the prior art species would anticipate the claims unless applicant was entitled to his foreign priority date.). The Office declares the exponential function "e" as the genus to which the prior art depicts the species i.e., log parallel process equation.

4. Communication is shared information to which the PE's determine as described within pg. 2, lines 12-17 of the specification.

5. Definition of module (from www.dictionary.com): Computer Science. A portion of a program that carries out a specific function and may be used alone or combined with other module of the same program.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Lubachevsky, titled, "Bounded Lag Distributed Discrete Event Simulation" 1988, hereafter Lubachevsky.

Claim 1: A method executed in hardware simulating events (abstract: lines 1-3) comprising the steps of: assigning events in a physical system comprising the steps of: assigning events of said physical system that are to be simulated to each of the processing elements (abstract: line 12)(PEs (abstract: line 12)); and said N PEs (abstract: line 12) simulating events in parallel, in a simulation step where each processing element (PE) simulates assigned events in blocks of M edge events (pg. 183, Introduction, left column, 1st paragraph, lines 5-10), where M is approximately a $\log_e N$, e is approximately 2.71828 (see claim interpretation) and an edge event (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) is an event whose simulation (title) in a processing element is directly affected by information originating in another processing element (pg. 183, right column, section 2, "Overview of the existing methods for a discrete event simulation", lines 5-14).

Claim 2: The method of claim 1 where each of said simulation steps comprises one or more iterations (pg. 183, right column, last paragraph).

Claim 3: The method of claim 2 where each iteration comprises a simulation phase followed by a communication phase and an assessment phase (pg. 186, right column, 2nd paragraph, "synchronization").

Claim 4: The method of claim 3 where, in each communication phase, each of said PEs (abstract: line 12) shares information with one or more other PEs (abstract: line 12) from said N PEs (abstract: line 12), which information is needed by said other PEs (abstract: line 12) to simulate edge events of said other PEs (abstract: line 12) .

Claim 5: The method of claim 4 where said information shared by each PE (abstract: line 12)in a communication phase of an iteration is related to events simulated (title) by said each PE in said iteration (pg. 183, right column, last paragraph).

Claim 6: The method of claim 4 where said assessment phase (pg. 186, right column, 2nd paragraph, "synchronization") carried out by each of said PEs (abstract: line 12) comprises the steps of determining whether the existence of a simulation error can be excluded and directing that another simulation (title) iteration is to take place when the existence of a simulation error (pg. 186, right column, last paragraph) cannot be excluded (pg. 186, right column, 2nd paragraph).

Claim 7: The method of claim 6 further comprising a floor (pg. 186, left column, last paragraph, line 3) advancement step, that is carried out when said step of determining, in said assessment phase (pg. 186, right column, 2nd paragraph, "synchronization") concludes that there are no simulation errors iteration, where the advancement step advances a simulation floor (pg. 186, left column, last paragraph, line 3) time of a present simulation step to form a modified simulation time floor (pg. 186, left column,

last paragraph, line 3), for simulating another block of M events in a next simulation step.

Claim 8: The method of claim 6 further comprising a step of advancing a simulation floor (pg. 186, left column, last paragraph, line 3) time from a simulation floor (pg. 186, left column, last paragraph, line 3) time of a present simulation step, to form a modified simulation floor (pg. 186, left column, last paragraph, line 3) time, for starting from said modified simulation floor (pg. 186, left column, last paragraph, line 3) time the simulation of another block of M events in a next simulation step, when said step of determining in said assessment phase (pg. 186, right column, 2nd paragraph, "synchronization") concludes that there are no simulation errors in said present simulation step.

Claim 9: The method of claim 8 where said modified simulation floor (pg. 186, left column, last paragraph, line 3) time corresponds, to the earliest simulation time of the M^{th} edge event (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) simulated by said N PEs (abstract: line 12) in said present simulation step.

Claim 10: The method of claim 4 where events are simulated seriatim (pg.183, right column, last paragraph, "successive states") in each simulation phase.

Claim 11: The method of claim 10 where for simulating a second event following a simulation of a first event, a time interval is identified between a simulation time of said

first event and a simulation time of said second event, and said second event is identified for simulation.

Claim 12: The method of claim 11 where said second event is identified for simulation following a step of accounting for simulation of said first event and simulation of events in said other PEs (abstract: line 12) from said N PEs (abstract: line 12).

Claim 13: The method of claim 12 where said accounting is based on present knowledge of states of said other events (title).

Claim14: The method of claim 12 where said accounts for simulation of events in said other PEs (abstract: line 12) from said N PEs (abstract: line 12) accounts for events simulated during said time interval.

Claim15: The method of claim 11 where said second event is identified by employing a first random number (basic probability, well known).

Claim16: The method of claim 11 where said time interval is identified with a second random number (basic probability, well known).

Claim 17: The method of claim 16 where said second random number (basic probability, well known) is set to said first random number (basic probability, well known).

Claim 18: The method of claim 15 where said first random number (basic probability, well known) is derived from a random variable having a uniform distribution (Gaussian Distribution; well known probability density function).

Claim 19: The method of claim 15 where the seriatim (pg.183, right column, last paragraph, "successive states") simulation of each event in said block of M events, in a first iteration starting from a given simulation floor (pg. 186, left column, last paragraph, line 3) time, employs an independently derived random number (basic probability, well known) from said random variable, forming thereby a sequence of random numbers (basic probability, well known), and simulation of said block of M events in all subsequent iterations (pg. 183, right column, last paragraph) starting from said given simulation floor (pg. 186, left column, last paragraph, line 3) time employs said sequence of random numbers (basic probability, well known).

Claim 20: The method of claim 18 where the sequence of random numbers (basic probability, well known) employed in one simulation step is different from a sequence of random numbers (basic probability, well known) employed in another simulation step.

Claim 21: Apparatus that includes N interacting processing elements (abstract: line 12)(PEs) abstract: line 12)), the improvement characterize by: each of said N PES (abstract: line12) storing a specification of a subsystem of a system composed of interacting subsystems; and said N PEs (abstract: line 12) (a) executing a selected number of simulation steps, and in each simulation step each of said PE's simulates a block of operational events of its associated subsystem, where a block contains M edge events (pg. 183, Introduction, left column, 1st paragraph, lines 5-10), when M is approximately equal to log N, and an edge event (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) is an event (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) whose simulation in a processing element is directly affected by information originating in another processing element, and (b) outputting results of the simulations (well known for outputs to emerge from a simulation program).

Claim 22: A storage element (i.e., computer) comprising: a first module (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) that when executed in a processor, simulates operational events (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) of a stored subsystem that is pad of a system of interacting subsystems, primarily in blocks that contain M edge event (pg. 183, Introduction, left column, 1st paragraph, lines 5-10), in addition to non-edge events (pg. 183, Introduction, left column, 1st paragraph, lines 5-10), where M is approximately equal to log N, and an edge event (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) is an event whose simulation in a processing element is directly affected by

information originating from simulations by another module (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) that is substantially the same as said first module, (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) which other module (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) is executed in another processor; and a second module (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) that outputs (well known for outputs to emerge from a simulation program) simulated operational events (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) resulting from execution of said first module(see claim interpretation with pg.186, figure 4.1, parallel event driven simulation).

Claim 23: The storage elements of claim 22 further comprising a third module (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) that communicates with said module (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation).

Claim 24: The storage element of claim 23 further comprising a forth module (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) that assesses whether, based on information received by said third module, (see claim interpretation with pg.186, figure 4.1, parallel event driven simulation) any of said M edge events (pg. 183, Introduction, left column, 1st paragraph, lines 5-10) need to be-resimulated.

Section II: Response to Arguments

101/112

8. Applicant is thanked for responding to these issues. Rejections are withdrawn.

Request for Prior Art

9. Applicant is thanked for responding to this issue. All documents have been received.

102(b)

10. Applicant's arguments, see pages 7-10, filed on 06/01/2006, with respect to the rejection of claims 1-20 under 35 U.S.C. 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Lubachevsky titled, "Bounded Lag Distributed Discrete Event Simulation" 1988.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (7:00 am- 4:30 pm EST).

If attempts to reach the examiner by telephone are unsuccessful, please contact examiner's supervisor Mr. Anthony Knight 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.. Answers to questions regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) (toll-free (866-217-9197)).

November 21, 2006

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TS